

"3. That the legislature take into consideration the plan of providing for the State pauper lunatics in a separate hospital, suitable to their condition and wants, where the curable may be restored, and the incurable be properly and comfortably kept.

"4. That the law of 1836, ordering the creation of county receptacles, be then repealed, and the counties be relieved of the responsibility of providing for the wants of the State.

"5. That all the laws in respect to insanity and hospitals be revised, and reduced to a code more suitable to the wants and the practice of the times."

They advise that the new hospital shall be upon one of the great thoroughfares of the State, near some large town or village; that it have not less than 250 or 200 acres of land, and that it be made for not over 250 patients; expressing the opinion that "one for 200 would be probably more advantageous to its great purpose—the healing and the management of the insane, and consequently more profitable to the State." They also advise, "that, in selecting a location, no regard be paid to inducements that may be held out by towns, by the offer of lands, or of subscriptions to aid in the purchase, and that no gifts be accepted that will imply any obligation of the State to continue the institution in a place where it may seem expedient to remove it; and no lesser present interest be allowed in any way to compromise the greater and future interests of the State, and the lunatics for whom the whole institution is to be created. Like discreet individuals, the State should go into the market, make its selection with the sole view of effecting the final purpose, purchase its lands, and pay the usual price, and then be independent of all further obligations."

The objects of this commission were of great import, regarded in the light of either medical science, humanity, or political economy. The pursuit of them involved a vast amount of labour; the results of which are embodied in a work which, in its kind, has never been equalled on this side of the Atlantic, never excelled beyond it. Its statistics are probably more accurate than any of a similar kind which have ever been collected. It is replete with suggestions which, although intended for specific and local application, will be of essential importance and assistance, in each and every other of the States of the Union where the same or similar subjects may come before the attention of the legislature or its Commissioners.

P. E.

---

ART. XV.—*On the Organic Diseases and Functional Disorders of the Stomach.* By GEORGE BUDD, M. D., F. R. S., Professor of Medicine in King's College, London, &c. &c. Philadelphia: Blanchard & Lea. 1856. 8vo. pp. 252.

The lectures comprised in the present volume have, nearly all of them, appeared before in one of the weekly medical journals of London. They are here collected together in a more convenient form, with such additions and corrections as the subsequent experience of the author had suggested. They present a very clear and sensible exposition of the leading diseases, functional and organic, to which the stomach is liable. The great aim of the author in his discussion of these is to present such views of their etiology and pathology, sanctioned by his own observations and those of the leading authorities of the profession, as are calculated to lead to a correct diagnosis and successful treatment. He indulges but little, if any, in mere theoretical disquisitions; his teachings are restricted to the exposition of well authenticated facts, and their direct practical bearing.

The first two lectures, with the exception of a few introductory remarks on the difficulties attending the study of stomachic disorders, are devoted to a consideration of self-digestion of the stomach, or the softening and destruction of the coats of that organ from the action of the gastric juice after death. The different circumstances under which this accident occurs—its essential charac-

ters as revealed upon dissection, and the diseases with which it is usually associated, are very fully indicated.

The accident, Dr. Budd remarks, is usually found in persons who die of disease in some other organ, and of those diseases especially which have long been known to lead to secondary functional disorder of the stomach. As it is, in any case, a clear proof of the presence of active gastric juice, or its acid, in the stomach at the time of death—consequently, its frequent occurrence in those who die of the diseases above mentioned, is an evidence that the functional disorder of the stomach so common in those diseases, is associated with increased secretion of gastric juice or its acid; or with secretion of one or other when there is no food in the stomach, or with undue retention of it in the stomach—so that at the time of death active gastric juice is present in the stomach, and subsequently dissolves or digests its coats.

The question as to how this functional disorder is brought about in the several diseases, and what is its real nature, is disposed of by Dr. B. as follows:—

"When disease of any one organ causes secondary disease of another and distant organ, it must be either through the circulating fluids, or through the nervous system. It is only by the circulating fluids, or through the nerves, that disease of an organ can cause secondary disorder of a different organ remote from it. But in the cases in question, this secondary disorder of the stomach can hardly arise through the blood. Tubercular disease of the lung, continued fevers, inflammatory diseases of the brain, cancer of the uterus, and mere functional disorder of this organ, lead to no common change in the blood by which this peculiar functional disorder of the stomach can be explained. We are driven then to the inference, that the secondary disorder of the stomach in these diseases is produced through the intervention of the nervous system. And this inference is confirmed by the fact, that in phthisis the softening of the coats of the stomach after death, like the functional disorder that usually precedes it, is more common in women than in men; and that when it results from inflammatory disease of the brain, it is much more common in young children than in grown up persons. For the same primary disease, whether it be of the brain or of the lung, the change is most common in those persons who, by their sex and age, are most liable to sympathetic disorders."

"Considering then this functional disorder as a sympathetic disorder excited through the nervous system, the further question arises—What is its real nature? Does this sympathetic disorder affect the secreting apparatus of the stomach, or merely its muscular coat?

"In my last lecture I mentioned the circumstances which led me to infer that the outpouring of the gastric juice, which has been supposed to result from direct irritation of the stomach alone, might also be excited, through reflex nervous influence, by irritation of other parts; that as the flow of urine may be increased by emotion as well as by direct irritation of the kidneys through the blood; or as the secretion of tears may be excited by irritation of the nostril or the mouth, or by emotion, as well as by irritation of the surface of the eyeball; so might the outpouring of the gastric juice be excited by irritation of the fauces, and therefore probably of the lung, or by irritation of the brain, as well as by mechanical or other irritation of the inner surface of the stomach itself. The circumstances which I have brought under your notice to-day confirm this inference, and afford additional grounds for supposing that in many of the cases we have been considering, it is to the secretion of gastric juice excited in this way in the empty stomach, that the symptoms referable to the stomach, and the digestion of its coats after death, are mainly owing; that the secondary disorder of the stomach which occurs in inflammatory disease of the brain, in phthisis, and in various diseases of the abdominal viscera, affects the secreting apparatus of the stomach, as well as its muscular coat."

"The secretion of gastric juice when the stomach is empty of food, is, of course, a waste of digestive power, and necessarily leaves the stomach more or less exhausted for time. If, after the wasted juice has passed away, more food be taken than the exhausted stomach can readily dissolve, it frets the mucous membrane, and may cause it to secrete an unhealthy mucus, which,

acting as a ferment, may lead to the frequent and abundant generation of lactic acid from the saccharine elements of the food.

"In some of the cases to which I have alluded, the softening of the coats of the stomach may, however, be accounted for in another way—namely, by supposing that an impediment existed to the free action of the muscular fibres, so that the stomach could not be completely emptied, and that the acid thus remaining in the stomach after digestion was over, dissolved its coats after death. Softening of the stomach, which may be satisfactorily accounted for in this way, is now and then found in conjunction with cancer of the pylorus, and in some cases of simple ulcer of the stomach, when the ulcer is near the pylorus, or when it is of long standing and partially cicatrized, so that it has altered the shape of the stomach and prevents the proper action of the muscular fibres. The explanation applies also to those cases of phthisis in which the stomach is found much enlarged as well as softened. It was particularly remarked by M. Louis, and has been long known, that the stomach often becomes much enlarged in the course of phthisis, being not unfrequently found after death three or four times its usual size. No satisfactory explanation of this enlargement of the stomach has, that I am aware of, been yet given. M. Louis ascribed it to the frequent cough; but if it were so produced, it would be observed in conjunction with mere chronic catarrh as frequently as with phthisis. The real cause of it is, I believe, enlargement of the liver from fatty degeneration, which always exists in those cases of phthisis in which the stomach is found much enlarged after death. The large liver compresses the pyloric division of the stomach, and prevents the stomach from being emptied through the pylorus by the wasted and weakened muscular fibres. When this happens, some of the acid products of digestion must remain in the stomach, and may be the cause of the softening of its coats found after death. In many cases of phthisis, and in most of the cases of other diseases in which the stomach is found softened, the change cannot be thus explained, and can only be accounted for by the supposition I have before advanced."

Dr. B. points out the importance of an intimate acquaintance with the subject, and the acquisition of clear and definite views of the circumstances under which softening of the stomach is most liable to be met with after death. This is obviously essential with reference to medico-legal inquiries, as well as to the attainment of a right knowledge of the pathology of the digestive organs. The subject is important also in a practical point of view—leading to a more intimate knowledge of a peculiar form of indigestion, of not unfrequent occurrence, attended with various distressing symptoms referable to the stomach and bowels—the result mainly of the presence in them of free, uncombined digestive acid; which symptoms are relieved by the liquor potassæ, and other alkalies and alkaline remedies.

The subject of the third lecture is congestion of the stomach. Dr. B. considers congestion of the stomach to depend upon either an impediment to the course of the blood through the liver or the chest; upon inflammation, the growth of a cancer, or other structural changes in the organ; or upon a change in the relative proportion of the constituents of the blood, or the presence of some foreign matter in it, which, by modifying its consistency, renders its propulsion more difficult; or by changing the chemical relation which naturally exists between the blood and the tissues, may cause it to pass less freely than naturally through the capillary vessels, and so accumulate in them. When congestion of the stomach attains a certain degree, an oozing of blood from the open surface of the mucous membrane takes place, which, if of any extent, gives rise to a vomiting of blood, often in small, blackish coagula; such vomiting constituting, perhaps, the most distinct and conclusive evidence of congestion of the coats of the stomach.

Among the cases of stomachic congestion and consequent discharge of blood by vomiting, which Dr. B. ascribes to a morbid state of the blood, he enumerates that which now and then occurs in females, from a stoppage of their monthly courses; that which is sometimes met with in cases of malignant cholera; the characteristic black vomit of yellow fever; the hemorrhage from the stomach that occasionally occurs in the course of typhoid fever; and, perhaps,

the hematemesis consequent upon arrest of hepatic secretion, or a permanent closure of the common gall duct, and that which sometimes occurs in patients who have laboured for some time under great enlargement of the spleen.

Occasionally hemorrhage from the stomach from congestion of its bloodvessels, instead of being the effect of a single condition, is attributable partly to obstruction to the current of blood through the liver, rendered more effective, it may be, by feeble propulsive power in the heart, and partly to an unhealthy condition of the blood itself disposing to hemorrhage, which is sometimes brought on by watching, mental anxiety, or other depressing influences.

The entire lecture is replete with instructive practical remarks; a careful study of which will amply repay the time devoted to it.

The ensuing four lectures are devoted to a consideration of inflammation, and the resulting ulceration of the stomach. Inflammation is considered as of various degrees or kinds, according as it is excited by undigested food, or alcoholic drinks; by more powerful mechanical or chemical irritants, and by defective nutriment, or the presence of noxious matter in the blood.

This manner of treating the subject, which, at first view, strikes us as a very awkward and unscientific one, has, nevertheless, in the hands of Dr. B., enabled him to present a very clear and able exposition of the several forms and grades of inflammation of the stomach as commonly encountered in practice, of a strictly clinical application. That portion of the author's prelections devoted to stomachic inflammation resulting from severe or long continued abstinence, or confinement to food of an unnutritious character, is particularly interesting. He offers, it is true, little that is new upon the subject; his digest of the recorded observations of others, is, however, clear and instructive.

As instances of inflammation of the stomach the result of some noxious matter in the blood, Dr. B. refers to that observed in yellow fever and cholera, and to certain gouty states of the system.

The mammillated condition of the mucous coat of the stomach so generally set down as an unequivocal result of inflammation, Dr. B. admits may, in some cases, be a result of the thickening of the gastro mucous membrane which inflammation causes, but, at the same time, believes that it may equally arise from any other vital process which increases the secreting activity of the cells and favours the retention of the secreted fluids within them.

"That it is not," he remarks, "generally a serious pathological change is sufficiently shown by the observation of M. Louis himself—that often it is not denoted by any symptoms of gastric disturbance, and that it is always found in conjunction with some other disease. Another circumstance which shows that it cannot be considered in all cases a morbid state is, that it is sometimes found in persons killed by accident in the midst of health."

The subject of ulceration of the stomach is treated of with great care and clearness. The perforating ulcer occurs under circumstances which render it difficult to arrive at any positive conclusions as to what agency produces it. It is met with in both sexes, but, as it appears, more frequently in women than in men. It seldom occurs under the age of sixteen, but is met with at all ages subsequently, more frequently, however, according to Rokitansky, in persons beyond fifty than in those under thirty. It occurs in all countries where morbid anatomy is cultivated; in agricultural districts and in large cities. Much more frequently, even considering their relative numbers, among the poor than among the rich. In England, according to Dr. B., it is most commonly met with in the class of maid servants, between the age of eighteen and that of twenty-five. Finally, the ulcer has not been found in conjunction with, or as a sequel to, any other disease, with such frequency as to lead us to conclude that it has any intimate connection with it.

"The circumstance," remarks Dr. B., "if it be true, that the disease is more frequent, relatively to their numbers, among the poor than among the rich, and that it is more frequent among unmarried maid servants than in other classes, would favour the inference, that a state of anaemia disposes to it. But it is almost idle, at present, to speculate further. The observations yet made do not enable us to explain how it is that the ulcer hardly ever occurs under the age of sixteen; how or why it is that the ulcer is always situated in what has

been termed the pyloric division of the stomach or in the first part of the duodenum; how it is, again, that the ulcer is generally single, and that it is so much more frequent along the lesser curvature of the stomach, or near it, than in any other part. Peculiarities in the structure or function of the pyloric division of the stomach, or some physiological relation between the stomach and other parts not yet suspected, may, by and by, be brought in evidence, and may, perhaps, furnish satisfactory answers to these important questions. That there are such physiological relations as I have here suggested, is rendered extremely probable by the remarkable discovery made a few years ago by Mr. Curling, that severe burns are frequently followed, at least in young persons, by a sloughing ulcer of the middle portion of the duodenum, which, like the ulcer of the stomach of which I am speaking, frequently destroys life by eating into an artery, and thus causing sudden and profuse hemorrhage, or by leading to fatal perforation."

In the treatment of ulcer of the stomach, Dr. B. depends mainly upon a proper regulation of diet, with the trinitrate of bismuth, and magnesia to obviate acidity; powdered ice to allay undue irritability of the stomach; opium to appease pain and obtain quiet nights; the aloetic or compound colocynth pill to obviate costiveness; perfect rest, abstinence from food, turpentine, acetate of lead, opium, alum and tannin to restrain hemorrhage; citrate of iron to remove the anæmia consequent upon profuse hemorrhage, and when feverish symptoms arise with much tenderness at the epigastrium, abstinence from food, opium, and rest. By this treatment, for the details of which we refer to the lecture before us, Dr. B. states that, at the hospital, he has had positive proof in several instances, that ulcers of the stomach have healed. In most cases, perhaps, Dr. B. remarks, the chief impediment to the cure of these ulcers, when they are not large or of long standing, arises from the difficulty of making the patient submit long enough at a time to the restricted diet that is necessary for it. The pain may not be sufficiently severe, or the general symptoms sufficiently alarming, to furnish an adequate motive for so much self-denial. The ulcers consequently persist until they cause perforation, or, until, from their edges becoming thick and hard, they are very difficult to heal.

The eighth lecture is on cancer of the stomach. It contains a very able digest of the leading facts in relation to the character and progress of the several forms of cancerous disease with which the stomach is liable to be affected, the symptoms to which they give rise, their diagnosis, and the ameliorative treatment best adapted to lessen the sufferings of the patient.

The sympathetic disorders of the stomach resulting from irritation seated elsewhere are treated of in the ninth lecture. The very excellent remarks of the author on these affections have a decidedly practical bearing. The treatment of them when considered separately from the remote irritations by which they are produced and kept up, can of course be only palliative, though, in many cases, this becomes of no little importance from the distress and suffering to which they give rise. Their removal can seldom be effected until a cure of the diseases of which they are symptomatic is effected.

In the ensuing lecture, the subject discussed is the deficient secretion of gastric juice, the circumstances under which it occurs, and the results to which it gives rise, the more prominent of which is slow and imperfect digestion; the morbid phenomena consequent upon which are well delineated by Dr. B., and the treatment adapted to restore the secretions of the stomach to their normal condition, and in this manner enable it to digest the food introduced with sufficient promptness and perfection, is very clearly pointed out. One of the frequent consequences of the imperfect supply of the gastric juice and the impediment which thence arises to the regular and proper changes being effected in the food taken into the stomach, is the fermentation of this in its half digested state, giving rise to flatulency and the formation of various acids. A particular kind of fermentation thus occurring in the contents of the stomach is attended with the formation of those curious bodies, the *sarcinae ventriculi*, first discovered by Mr. Goodsir, in 1842. All the facts known in relation to this particular form of stomachic fermentation, or, perhaps, more correctly speaking, of some of the conditions under which sarcinae have been met with

in the stomach, are presented in the eleventh lecture. From these, however, no important general conclusions can be drawn in regard to the mode of production of the bodies referred to. It appears to Dr. B. from the details of the cases given by him, and many similar ones on record—

"That the peculiarity of the disorder we are considering consists in this, that the secretions of the stomach, which seem to be usually more abundant than natural, undergo, or excite in the food in the stomach, and after they have been thrown up from it, a fermentation which is attended with the evolution of carbonic acid and with the production of torulae and sarcines, and which leads to the formation of acetic acid. The production of the disorder seems to require that there shall be some condition which prevents the stomach from completely or readily emptying itself.

"The disorder may occur in young persons, and exist for a short time, as in one of the cases related by Mr. Bush, and in a case that has been recorded by Dr. Bence Jones, in which it was noticed a short time before death in a boy of fourteen, who died of peritonitis and granular disease of the kidney, but it has been more frequently noticed in men who have reached middle age—persons more liable than any others to simple stricture and cancer of the pylorus and to other diseases which prevent the stomach from completely emptying itself—and in such persons the malady is usually of long duration, and may, indeed, continue to the end of life."

The remaining five lectures are devoted to the consideration of the subject of indigestion generally. The entire subject is treated with great ability under the heads of Indigestion arising from defective action of one of the excreting organs, or from some fault in the nutritive processes in other parts of the body; the purity of the blood being, in this manner, impaired, rendering, as a consequence, the secretions of the stomach insufficient or unhealthy. Thus, indigestion is a common result of defective action of the liver or of the kidneys, as well as from faulty assimilation, giving rise to the formation of the lithic acid or oxalic acid diatheses.

The remarks of the author in reference to these forms of digestion are replete with good sense and have a direct and important practical bearing.

Dr. B. considers next the forms of indigestion characterized by some peculiarity in the symptoms—urticaria, pyrosis, gastralgia, etc. The indigestion of drunkards is treated of separately. The general symptoms of stomach disorders—pain and soreness of the epigastrium, vomiting, excessive acidity and flatulence are then discussed.

Acidity of the stomach may, according to Dr. B., result either from acid poured out by the glands of the stomach; from acid taken in the food, or generated by some fermentative process occurring in the food within the stomach.

"The glands of the stomach," Dr. B. remarks, "only secrete, as far as we know, muriatic acid, perhaps lactic acid, and, in certain circumstances, carbonic acid. There may be generated in the stomach by different fermentative processes—lactic acid, acetic acid, oxalic acid, butyric acid, carbonic acid, and probably many others. The acids that cause excessive acidity of the stomach are the muriatic and the lactic, singly or combined. Acetic acid is formed more rarely; oxalic and butyric acids in too small quantity to produce this effect; and carbonic acid seems to be only troublesome or injurious from the flatulent distension it occasions."

Flatulence of the stomach may, Dr. B. believes, be ascribed to one or other of the three following sources: 1. Air swallowed. 2. Gases generated from food or secretions in the intestinal canal by some fermentative process. 3. Gas secreted or evolved by the coats of the intestinal canal from the blood.

Some have affected to deny the possibility of gas being in any instance abnormally secreted or evolved from mucous or other surfaces. The fact is now, we believe, very generally admitted. The only gases the blood contains are those of the inspired and expired air—oxygen, nitrogen, and carbonic acid—and it is clear that oxygen, which is constantly needed in the blood, and which it is the business of respiration to supply, cannot be exhaled; so that the only gases that can pass directly from the blood into the intestinal canal, are nitro-

gen and carbonic acid. It follows, therefore, as Dr. B. states, that no oxygen can get into the intestinal canal excepting from air swallowed, and that its amount cannot be greater than in that; namely, than one volume to four of other gases.

"The gases furnished by fermentative processes in the intestinal canal, are carbonic acid, hydrogen, different compounds of hydrogen and nitrogen. Lactic and the viscous fermentation may occur without any evolution of gas. Vinous fermentation evolves carbonic acid; butyric fermentation, carbonic acid and hydrogen; common putrefactive changes generate these gases, nitrogen, and various compounds of hydrogen, such as sulphuretted hydrogen, carburetted hydrogen, and ammonia. While these gases are being evolved, the quantity of oxygen in the intestinal canal, derived from the air swallowed, is gradually lessened by some of it entering into combination with other substances and some of it passing, without change, into the blood. Stinking putrefactive changes—leading to the evolution of sulphuretted and carburetted hydrogen—require some time for their production, and are retarded by the acids of digestion, so that they seldom take place in the stomach, but are very common in the large intestine. When they do take place in the stomach, they are recognized by the eructation of the fetid sulphuretted hydrogen gas—the belching as of rotten eggs. The gases evolved by the ordinary fermentative processes in the stomach, consist of carbonic acid and hydrogen, and of carbonic acid in greater amount than hydrogen.

"The ordinary gases of the stomach are, therefore, oxygen, nitrogen, carbonic acid, and hydrogen. The oxygen is derived solely from the air swallowed, and its proportion to the other gases can never be greater, and must generally be very much less, than its proportion in atmospheric air. The hydrogen must be derived from some fermentative process, and must be much less in volume than the carbonic acid. So that when *distension* of the stomach occurs, it must be chiefly from nitrogen or carbonic acid; and if from carbonic acid, this must be derived, for the most part, from some fermentative process."

In discussing the treatment of stomachic disorders, Dr. B. passes in review the curative effects of ipecacuanha, bismuth, the vegetable astringents, hydrocyanic acid, the alkalies, the mineral acids, the vegetable bitters, the preparations of steel, and purgatives; noticing the particular indications they are severally adapted to fulfil, the particular cases and conditions of diseases in which they may be most profitably resorted to, and the forms and doses in which they are to be given; the remedial treatment being followed by a judicious set of rules for the dietetic management of the affections of the stomach originating in defective or disturbed digestion.

The five lectures devoted to a consideration of the pathology, symptomatology, and treatment of these affections, are replete with sound views and valuable practical directions. They will communicate to the medical student a very faithful idea of a class of diseases every practitioner will be called upon repeatedly to treat, and in which, by a correct appreciation of their several forms, and the nature and right application of the means adapted for their removal, he may promptly relieve his patients from much suffering and distress; or by mistaken views, an improper selection or wrong application of remedial measures, aggravate the disorder which it is his object to remove, or convert what was a perfectly controllable into an incurable disease.

Nor will the physician find the time devoted to the study of these lectures unprofitably spent. He will acquire from them many a practical hint of invaluable service to him when prescribing for some of the not uncommon, but more obscure forms of stomachic disease.

D. F. C.